

ALCOR LIFE EXTENSION FOUNDATION

CRYONICS

4TH QUARTER 2011 · VOLUME 32:4

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ROBERT ETTINGER
[1918 - 2011 - ...]

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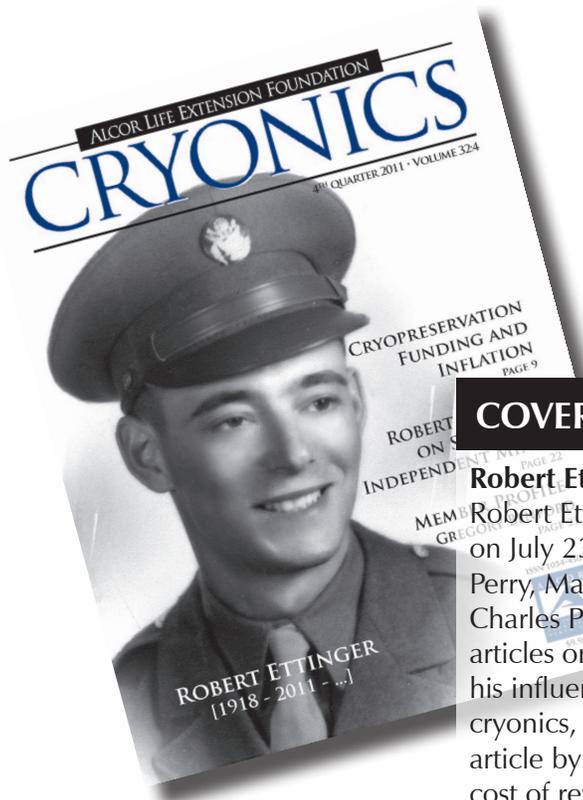
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ALCOR LIFE EXTENSION FOUNDATION

CRYONICS



Cover Photo:
Robert Ettinger, Soldier in WWII

COVER STORY: PAGE 16

Robert Ettinger [1918-2011-...]

Robert Ettinger was cryopreserved on July 23, 2011. Cryonicists Mike Perry, Mark Plus and Charles Platt contributed articles on Robert Ettinger and his influence on contemporary cryonics, followed by an older article by Ettinger himself on the cost of revival and rehabilitation of cryonics patients.

9 Cryopreservation Funding and Inflation

Alcor management and the Board of Directors have produced a detailed document that outlines the long-term problem of cryopreservation underfunding to discuss solutions with Alcor membership. We welcome feedback from our members on this important topic.

22 Robert Ettinger on Substrate-Independent Minds

The “father of cryonics” is often considered one of the inspirations of contemporary transhumanism, too. Many people do not know, however, that Ettinger became increasingly critical of the concept of ‘mind uploading’ in his late years. This document collects some of his most recent thoughts on this topic.

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Alcor CEO Max More writes about Alcor’s strategic objectives, relocation assistance for terminal members, and the importance of providing sufficient funding for your cryopreservation arrangements.

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Aaron Drake reports that Alcor has completed the process to obtain “Known Shipper” status with the Transportation Security Administration, presents new readiness developments at Alcor, and shows new cell phone options for members to alert Alcor in emergencies.

27 Member Profile:

Gregory Benford

Chana de Wolf features long-time Alcor member Gregory Benford, who is not just a top-notch scientist and science fiction writer, but is involved in a number of exciting life extension initiatives as well.

Member Communications Director

A new position called the **Member Communications Director (MCD)** has opened at Alcor.

The Member Communications Director's job will be to communicate with Alcor's members by email, by telephone, and in person for multiple purposes, among which are:

1. To find out more about the member, including such information as the member's health condition, occupation, work background, interests, family, and aspirations;
2. To determine whether the member wishes to engage in volunteer activities on behalf of Alcor and, if the member wishes to do so, to provide the member with a variety of ways in which the member can volunteer.
3. To answer the member's questions about Alcor.
4. To determine whether the member has left assets to be distributed to Alcor after death via a will, trust, or other document. If the member has done so, the MCD will offer to evaluate, in cooperation with attorneys of Alcor's choosing, whether the legal documents in which the bequest has been made have been executed in a manner that will do the job effectively and, if not, to help correct them;
5. To determine the member's general degree of wealth and whether the member has any interest in donating money (or other assets) or in leaving a bequest to Alcor. If the member is interested in making a donation, the MCD will provide the member with a variety of projects that need funding via tax-exempt donations. If the member is interested in making a bequest, the MCD will offer, in cooperation with attorneys of Alcor's choosing, to help the member in executing a will, trust, or other legal document to accomplish the bequest with attorneys of Alcor's choosing if it is appropriate to do so.

Qualifications:

The MCD should be an Alcor member who is (or becomes) knowledgeable about Alcor and issues in cryonics, is articulate in talking to members, and is sensitive enough to know when to push forward when members make it clear that they want to help Alcor or want help from Alcor. The MCD should also be able, in cooperation with others of Alcor's choosing, to prepare written information to help answer questions asked by members.

Compensation:

The salary for the MCD is \$60K plus benefits per year. This salary plus relocation expenses has been guaranteed for one year by the Life Extension Foundation (LEF). After one year, the Member Communication Director's continued employment at Alcor will be dependent upon his or her job performance.

Applications for the Member Communications Director should be (a) mailed to **D'Bora Tarrant at Alcor Life Extension Foundation, 7895 Acoma Drive, Suite 110, Scottsdale, Arizona 85260** or (b) be sent by email to **D'Bora Tarrant at: D'Bora@Alcor.org**.



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FROM THE EDITOR

On July 23rd, Cryonics Institute President Ben Best planned to visit our lab Advanced Neural Biosciences, Inc. while he was visiting Oregon to attend the annual *Society For Cryobiology* meeting. But just after the plane landed, Ben called to inform me that he would not be able to come to the lab because he had to return to Michigan immediately because a patient had gone down. Upon further reflection he decided to visit our lab after all because he determined that by the time he would be back in Michigan cryoprotective perfusion would have been completed and the patient would be cooling down to liquid nitrogen temperature. Upon arrival at our lab he disclosed that the patient in question was no less than the “father of cryonics,” Robert Ettinger. Not all pioneers in cryonics who have legally died have been cryopreserved so this news filled me with a combination of sadness and relief. I was particularly relieved when I heard that Ettinger received prompt cardiopulmonary support and cooling on the way to the funeral place for cryoprotective perfusion.

I didn't know Robert Ettinger very well, although he was kind enough to let me stay at his place once during a visit to the Cryonics Institute. He also made generous donations to the neural cryobiology research that Chana de Wolf and I have been involved in since 2008. Oddly enough, this year our paths crossed multiple times when we found ourselves on the same wavelength about the topic of ‘mind uploading.’ As people who follow online cryonics forums and mailing lists know, Ettinger spent a considerable amount of time debating advocates of mind uploading. Sometimes it seemed he almost categorically ruled out its feasibility. I never went that far but we agreed that many of the arguments in favor of it are premature, highly speculative, or even circular. I asked him multiple times if he was interested in publishing an article on the topic but he politely declined. I think there is no better tribute I can make to Ettinger than to present his views on “substrate-independent minds” in a more systematic form. Mike Perry, Mark Plus and Charles Platt also remember Robert Ettinger in this magazine.

Changing to another topic, Alcor has a serious problem with members who have not provided enough funding to pay for today's minimum levels for cryopreservation, in particular members who have made whole body arrangements. This issue contains an important strategic article from the Alcor Board of Directors and Management about underfunding and the sustainability of grandfathering. The Board anticipates making a decision about this problem in early 2012 and this document outlines their outlook. I personally think that their preferred solutions strike the right balance between holding individuals responsible for their own cryonics arrangements and helping those who have supported Alcor for many years but have a hard time bringing their funding up to date. I am a 37 year old whole body member myself and I recently was able to secure universal life insurance for \$500,000 for a reasonable monthly premium to increase my cryonics funding. I strongly encourage all underfunded members who are financially able to increase their funding to do so, too. If you do not completely agree with Alcor's solutions to the underfunding problem, please submit a letter to the editor or submit an article to outline your own perspective. Or register for an account for Alcor's new member-only forums at: <http://www.alcor.org/forums> and weigh in on this important topic. We really want to hear from you. In this issue we also re-publish a characteristic 2003 *Physical Immortality* piece by Robert Ettinger on the cost of revival and rehabilitation of cryonics patients for context and comparison.

If you have read Sterling Blake's cryonics novel “Chiller” you probably know that Sterling Blake is the astrophysicist, and long-time Alcor member, Gregory Benford. In this issue's member profile we will meet this fascinating individual and also learn what he is doing to increase our chances to extend our lives here and now.

As you can see in our most recent quarterly membership update, Alcor is struggling to get to the 1,000 member landmark. Membership growth is slowing because more members are cancelling due to financial hardship, despite our efforts to retain them. Please do not put your cryonics arrangements at the bottom of your priorities and encourage others to make cryonics arrangements as well. We remain optimistic that we can be 1,000 members strong at our 40th anniversary in 2012. Stay tuned for more announcements.

Aschwin de Wolf

CEO Update

By Max More



What to Do?

I recently celebrated my first quarter-century as an Alcor member. When I joined back in 1986, I was the 67th member and Alcor had cryopreserved just six patients. Over the last 25 years we have overcome many challenges, made mistakes, solved problems, and grown in size and complexity. Now I find myself in a position to affect the direction of the next 25 years. But what to do? Out of all the possible strategic, operational, and managerial tasks, which should receive the most attention in the near future?

To help me keep the merely urgent at bay and to focus on the truly important, I have settled on four strategic priorities: robustness, growth, finances, and research.

Robustness includes succession planning, documentation of processes, patient security, political protection and relationship-building, continuous improvement of operations, prevention of fraud and theft, and a media action team to respond to criticism.

Growth includes a speakers' bureau, presence at conferences, updated and improved promotional material, use of social media, online video, and development of international membership and response capability. We can also pursue growth by improving membership retention and referrals by being better at communicating with members, by heightening the appeal and ease of use of the website, and by organizing and publicizing the Alcor-40 2012 conference.

Finances includes maintaining a balanced budget, pursuing a solution to underfunding and supporting its implementation, and finding new benefactors. It's crucial to maintain control over Alcor's finances, otherwise the more we grow the deeper in the hole we could dig ourselves.

Research starts with getting broad input into possible research goals consistent with Alcor's mission, especially high-value projects that are not being done by others. Of the four strategic priorities, so far I have given research the least attention. That will change over the last part of this year.

Supporting each of these strategic priorities, the whole Alcor team will focus on continuous improvement, or *kaizen* ("good change"). The managerial and cultural practice of *kaizen* involves teamwork, personal discipline, strong morale and engagement, a focus on quality, and welcoming and acting on suggestions for improvement from all sources.

Relocation Assistance for Terminal Members

If you should become terminal, are you aware that Alcor will *pay you \$5,000* to move to the Scottsdale/Phoenix area? The Comprehensive Member Standby (CMS) program, created in 2005, contains a provision that many members may not be aware of. The CMS covers both the standby and stabilization and transport phases of a cryopreservation. We encourage members—*especially* terminal members—to relocate to the Scottsdale area. Being located close to Alcor means we can respond rapidly and start procedures early, minimize logistical challenges, and control costs.

Several hospice facilities in the Phoenix and Scottsdale areas know about Alcor and welcome our terminal members. They cooperate by immediately pronouncing our members upon clinical death and smoothing the way for our team to do their work. The advantages of being located near to Alcor are so substantial in ensuring a suc-

cessful cryopreservation that the CMS policy provides up to \$5,000 of relocation assistance to any terminal member (with a prognosis of 90 days or less) who relocates to the greater Phoenix area. Don't miss out on this benefit! You can find more information here: <http://www.alcor.org/BecomeMember/standby.html>

International Capabilities

Although Alcor's membership is heavily US-based, we do have a significant number of members around the world. Even if we were entirely US-centric, Alcor should develop better international capabilities because US members travel overseas. Building capabilities for international deployment, while desirable, involves additional obstacles. Initially, I intend to focus on the United Kingdom, followed by the rest of Europe, and only then apply lessons learned to other regions.

We are in the very early stages of our international response plan. Currently we are gathering information and making contacts with all relevant and interested parties. These include UK-based cryonicists with whom we have had previous experience, Global funeral director Rowland Brothers, an embalming company in East Sussex, and some Europe-based cryonicists outside the UK. Among the next steps are checking UK laws; updating or replacing equipment currently in the UK; looking into contract paramedic agencies; and visiting England to observe UK cryonicists' skills in a training session and to establish better relationships.

We are also planning to deploy a capability for field cryoprotection of neuros with an open-circuit perfusion of stepped concentrations of M22 followed by dry

ice shipping. (This could also be used for overseas whole body members, although cryoprotection might initially be limited to the brain.) The benefits of this approach to neurocryopreservation is that it allows Alcor to provide cryoprotection to its foreign members; it greatly reduces or eliminates ice-temperature ischemic transport time (this means that a cryoprotection will take less than 8 hours from pronouncement to beginning of descent to dry ice temperature, eliminating 6 to 30 hours of ice temperature transit time); and it eliminates uncertainties related to the time requirements of ice transport, such as transit permits and airline schedules.

The Expanded Role of Suspended Animation

We can effectively pursue the goals of heightened resilience and continuous improvements not only internally but also by partnering with other organizations with high standards. Alcor has been making use of the services of Florida-based Suspended Animation for some time. At the recent Strategic Meeting we saw a presentation by SA and some of their contract medical personnel that led to a new policy calling for more extensive use of SA's standby and transport services. The funding available to SA means they have been able to develop capabilities not available to Alcor.

SA now has a network of cardiothoracic surgeons and clinical perfusionists that they will be attempting to deploy for all their cases. Alcor adopted a policy of attempting to use SA for all Alcor cases in the continental U.S. outside of Arizona for which they are available and for which their services are clinically indicated. Alcor staff and ACT teams will still be used as emergency first responders. Aaron Drake may sometimes accompany the SA team. Catherine Baldwin (SA's Chief Operating Officer) was added to the Alcor Deployment Committee and made an advisor to the Alcor Board.

Solving Underfunding and Inflation

Alcor has many members who made cryonics arrangements years ago when minimum funding levels were substantially lower. Unfortunately, those members (around two-thirds of all members) mostly did not plan to provide for increased funding to match rising costs resulting from inflation and new, more expensive procedures. Alcor has also been at fault for fail-

ing to sufficiently strongly emphasize the need to provide more funding than current minimums. As a result, as deeply underfunded members are cryopreserved, Alcor faces huge losses that threaten the survival of the organization.

I cannot emphasize enough that **prices will go up!** At a modest annual inflation rate of 3%, prices double every 24 years. If you will not need cryopreservation for another 48 years, at historically average inflation rates, a cryopreservation cost of \$80,000 in 2011 will end up costing \$320,000. And there's no guarantee that rates won't go up more than that, either due to higher average inflation or because the cost of cryonics procedures goes up more than general inflation (a situation familiar in the medical field). Every Alcor member should plan to take measures such as:

- Providing funding well over current minimums
- Adding additional life insurance funding over time.
- Selecting an insurance policy that provides some inflation protection by building value over time and by reinvesting returns.

Alcor must do more than hope that members take these actions. After months of detailed deliberation, we have come up with a range of possible solutions, one of which seems to us the most promising. Every member should read the article on Underfunding and Inflation [<http://www.alcor.org/Library/html/CryopreservationFundingAndInflation.html>]. During the three-month discussion period, we urge everyone to comment on the proposal and tell us if you think you have a better solution. Send your thoughts to us privately or post them on the new Alcor Forum.

Getting the Word Out

Barry Aarons has long helped Alcor remain on top of potentially damaging legislation and political developments. Part of this has meant Alcor leaders meeting with local politicians, so that they know our faces and are less likely to introduce or support legislation or regulations harmful to our operations and our patients. We have remarkably good relations with primarily conservative Arizona politicians. It now turns to me to maintain this favorable status.

Barry is also helping us deploy the Alcor Speakers' Bureau to give talks to organizations in the area. Last week, we started this effort modestly with me giving a talk to the Midtown Lion's Club. The goal is to build a reputation and have a voice in the influential local business groups.

Since last issue, I made several major trips. The first of these was a networking trip to Northern California. There I visited and talked to those involved in four organizations, each of which included several Alcor members: Halcyon Molecular, Singularity University, SENS Foundation (Strategies for Engineered Negligible Senescence), and BioTime. Halcyon has a number of Alcor members. The principals of the company and I discussed the possibility of making Alcor membership a company benefit (subsidizing or covering the dues).

The second trip was to Cambridge, England for the fifth SENS conference, organized by Alcor member Aubrey de Grey. On the afternoon of Saturday September 3, I gave a talk on "Cryonic Life Extension". This placed cryopreservation in the context of regenerative medicine and our shared goals. All signs suggest that the talk was well received—something I was unsure of, given that much of the audience now consists of mainstream researchers who may have been unfamiliar with the idea. Several people said they had been thinking about signing up, but would now definitely do so. We may even receive funding for research or other projects.

The third trip was a visit to Cryonics Institute in Michigan in mid-September. For details on this, please see Alcor News for September. [<http://www.alcor.org/blog/?m=201109>]

Smartening Up

This coming week, the October Alcor News will have a more detailed (and illustrated) report on upgrades to the building.

Last year, when I walked into Alcor, I felt like I was about to walk straight into a cubicle wall. The space felt crowded, dingy, and unwelcoming.

The entire area has been repainted, including the chipped baseboards and around the doors. We tore out the cubicle closest to the door and we turned the area created into a reception area that includes a sofa, chairs, and table that are stylish without being expensive, a convincing synthetic plant (real ones don't get enough light in that po-

sition), a Shoji screen, and an “infinity mirror”. The floors have also been cleaned and the facing cubicle wall covered by a metal sheet with “Alcor” emblazoned on it.

In the conference room, the walls and door to the Patient Care Bay have been painted. I observed that the walls were becoming madly crowded with photographs of patients and suggested that they should be replaced with an electronic display. Steve Graber ran with that idea and designed and built an appealing LCD display which cycles the pictures.

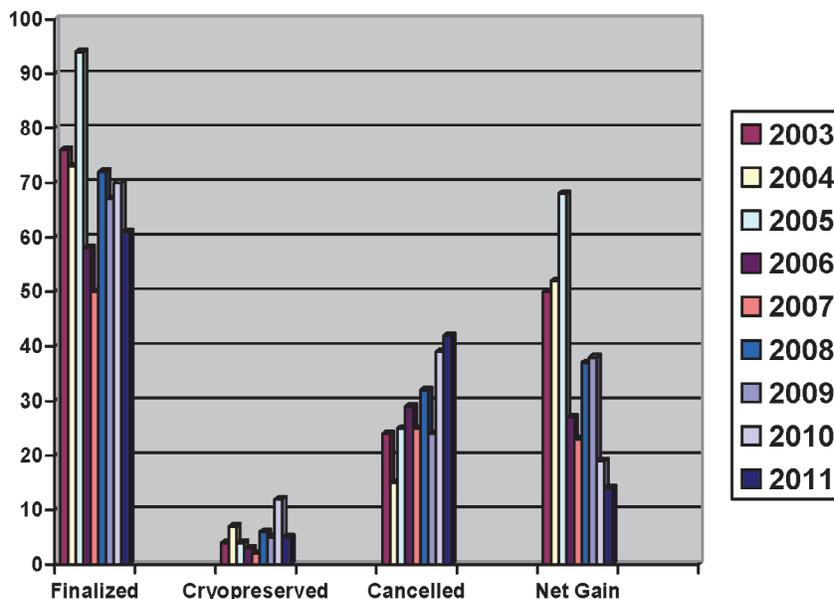
Some office walls have been repainted, and some mid-office areas have new tiling. The operating room and its equipment have been thoroughly cleaned, the floors polished, and dust mats added. A few other minor improvements to aesthetics and organization remain. These upgrades should make some visitors more comfortable in a place that can feel industrial and harsh. You can see photos of some of the changes in the October issue of Alcor News.

Some of you may read *Cryonics* but not the Alcor News email or blog. I urge you to

regularly check the online news source for items that may not be covered (or covered differently) in the magazine. You will find news on advances that I haven’t mentioned here such as major progress with the whole body automated cooldown table and the new, lighter, stronger, and more compact portable ice bath. I’ve heard a couple of complaints that we don’t send out notices of new issues of the magazine or Alcor News. But we do. If you’re not receiving them, **ask yourself: Have I given Alcor my current email address?** ■

Membership Statistics

2011	01	02	03	04	05	06	07	08	09	10	11	12	
TOTAL	930	932	935	943	945	948	955	944	947				947
FINALIZED	3	7	8	10	4	6	10	4	4				56
REINSTATED	1	2	0	0	2	0	0	0	0				5
CANCELLED	6	7*	4	2	3	2	3	14	1				42
CRYO-PRESERVED	0	0	2	0	1	1	0	1	0				5
NET GAIN	-2	+2	+2	+8	+2	+3	+7	-11	+3				+14



On June 30, 2011, Alcor had 948 members on its Emergency Responsibility List. Thirty-eight (38) memberships were approved during the first six months of 2011, five (5) memberships were reinstated, twenty-four (24) memberships were cancelled and four (4) members were cryopreserved. Overall, there was a net gain of eighteen (18) members this year to date.

CRYOPRESERVATION FUNDING AND INFLATION

THE NEED FOR ACTION

A Discussion Article by the Management and Board of Directors of Alcor

September 30, 2011

“Well organized public facilities on a substantial scale will probably exist fairly early in 1966, by present indications. The cost of cryostasis according to several independent estimates will be well within the \$8,500 figure I mentioned for preparation and perpetual storage, with easy financing through group insurance or similar plans.”

Robert C.W. Ettinger in his book,
The Prospect of Immortality,
paperback edition, postscript
dated October 29, 1965

The cryonics economies anticipated by Robert Ettinger in 1965 were never realized. By the 1970s, the cost of whole body cryopreservation as offered by TransTime and Soma (the for-profit arm of IABS, which later merged with Alcor) was \$60,000 (1). As shown in Fig. 1, the nominal dollar cost of cryonics has risen steadily with Consumer Price Index (CPI) inflation since then. By 2011, the minimum funding for whole body cryopreservation with Alcor was \$200,000. Even this large number has not kept pace with inflation, so another increase will be necessary soon.

Whenever Alcor has increased cryopreservation minimums, it has traditionally only required new members to meet new minimum funding requirements. Existing members were “grandfathered,” and allowed to remain members even if their cryopreservation funding fell below new minimums. This was and is believed to be important for members who due to age or disability become uninsurable, and would otherwise have to leave Alcor after many years of supporting the organization.

Alcor has managed grandfathering in a variety of ways. Younger members

History of Alcor Cryopreservation Minimums

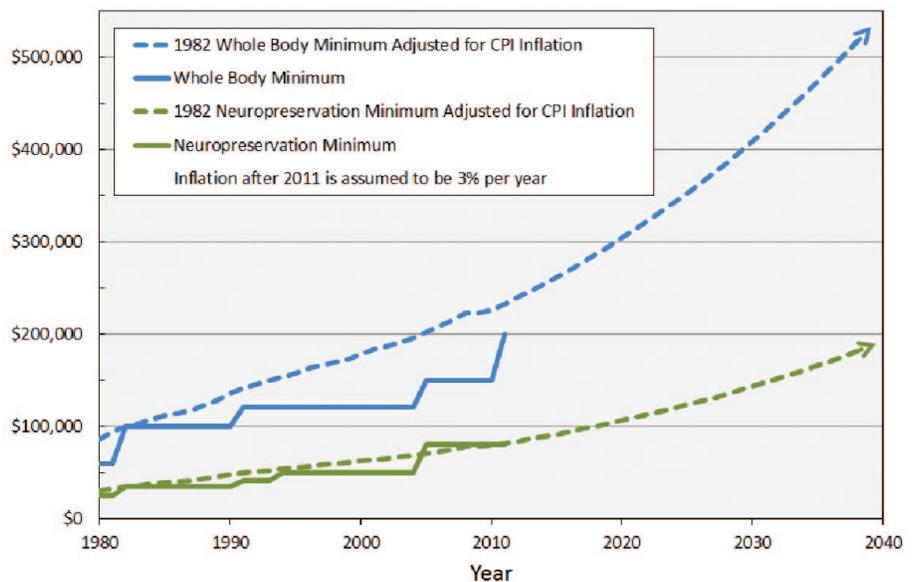


Figure 1

have been encouraged to provide more than minimum funding. Periods of rapid growth helped keep the fraction of members with less than minimum funding low. Savings programs, such as the “10% rule”

of the 1980s that diverted 10% of all gross revenue to the Patient Care Fund, helped protect against depletion of long-term care funds by underfunded cases. However the main way that Alcor coped with grandfa-

thering was by just taking the loss on what was historically a small number of underfunded cases. There was never a quantitative analysis of the impact of grandfathering, or a specific financial plan for dealing with it.

The sustainability of this has been questioned on numerous occasions. In 1991, Ben Best and others expressed concerns about grandfathering in a series of articles and letters in Cryonics magazine (2,3,4). Ideas for addressing the inflation problem were sought (5), but none were implemented. There was renewed public concern in 2009 when Charles Platt published an article about inflation and cryonics funding in Cryonics magazine (6), followed by a critical article on CryoNet in 2010 that accused Alcor of negligently ignoring the grandfathering problem (7,8). That same year Rob Freitas published a detailed quantitative analysis of Alcor finances based on publicly available information, and concluded that grandfathering was a serious long-term problem (9,10). Ralph Merkle subsequently published an article on cryopreservation funding that outlined 14 possible options for addressing the grandfathering problem (11). In 2011, the Alcor Board of Directors undertook its own quantitative analysis of grandfathering using internal data. The results of that analysis are below.

Alcor Member Underfunding in 2011

As of August, 2011, 944 members were signed up in expectation of Alcor performing cryopreservations costing \$142.6 million as measured by 2011 funding minimums. 533 members were signed up for whole body cryopreservation, and 411 members were signed up for neuropreservation. The total cryopreservation funding of those members was \$122.2 million, a funding shortfall of \$19.4 million. This net \$19.4 million shortfall consists of the total underfunding (\$32.6 million due to 641 under-minimum funded members) adjusted for the total over-minimum funding (\$13.2 million due to 229 over-minimum funded members). Most of this over-minimum funding was from 173 members signed up for neuropreservation with \$9.7 million in funding greater than minimum.

The distribution of members with funding below and above minimums is shown in Figs. 2 and 3 for neuropreservation and whole body members. 197 neuro-

Number of Neuropreservation Members in August 2011 vs. Funding Below or Above Minimum

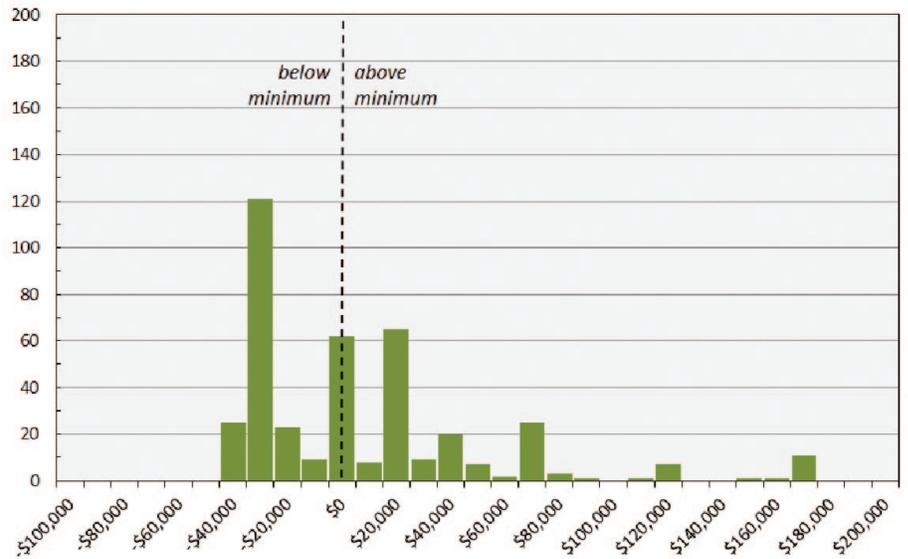


Figure 2

Number of Whole Body Members in August 2011 vs. Funding Below or Above Minimum

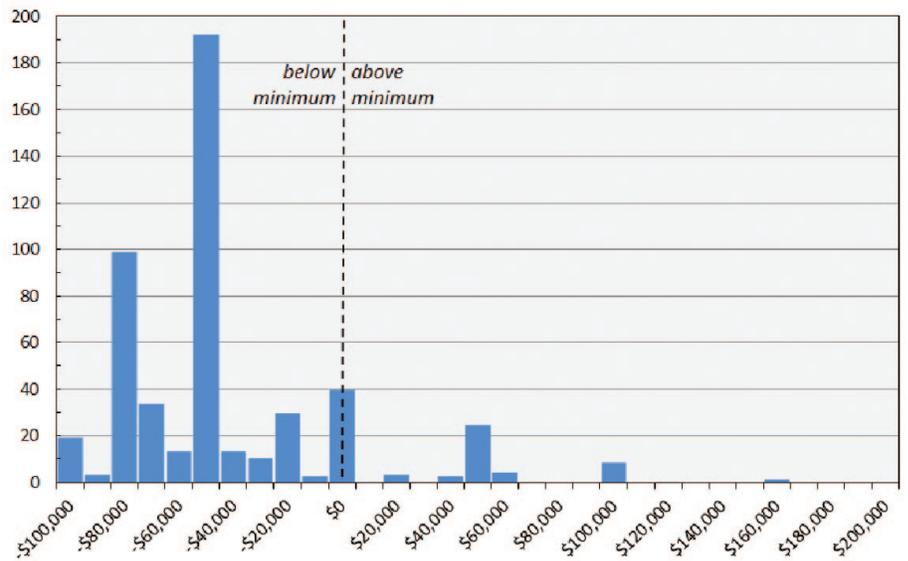


Figure 3

preservation members were underfunded with underfunding totaling \$5.6 million. In 2011, as a group, neuropreservation members were not underfunded. Underfunding is a much more serious problem for whole body members. 444 whole body members were underfunded with underfunding totaling \$27 million. The problem is worsened by the fact that Alcor has

failed to increase whole body minimums sufficiently to keep pace with inflation over the past two decades, so another increase in whole body minimums is necessary soon.

Ordinary inflation of 3% per year will increase the \$142.6 million 2011 cost of cryopreservation procedures for Alcor's 944 members by \$4.3 million per year. This is an unfunded liability that will grow for

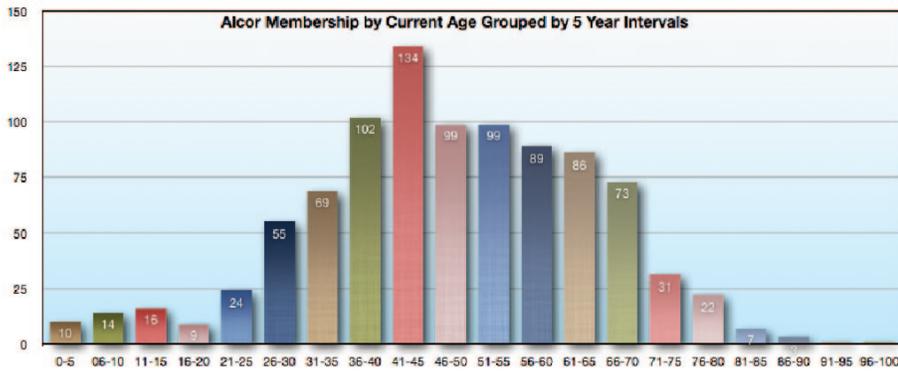


Figure 4 - courtesy Alcor Advisor Geoffrey Shmigelsky

decades until underfunded members are cryopreserved. (Most Alcor members are middle-aged as seen in Fig. 4.) The effects of this are already being felt. Actuarial analysis indicates that Alcor in 2011 can expect 9 cases per year, of which 7 will be underfunded by a total of \$380,000. This would be offset by an expected \$70,000 per year from cases with above-minimum funding, still leaving an expected case funding deficit of \$310,000 per year. This annual deficit will grow with time.

Underfunded cases have been a substantial contributor to Alcor deficits in recent years. They also deplete the Comprehensive Member Standby (CMS) fund, and especially compromise the Patient Care Trust. The effects of this can be insidious because in absence of careful monitoring, chronic underfunding of the Patient Care Trust (PCT) might not become obvious for years. For example, by 2010 Alcor was drawing on the PCT at a rate of 5% per year to pay the costs of maintaining its patients in cryopreservation. The PCT draw grew to this unsustainable percentage because underfunded cases led to the PCT principal not being as large as it should have been. The draw only retreated to 2.5% in 2011 after an unforeseen bequest fortuitously doubled the value of the PCT in late 2010.

What follows is a discussion of possible options for managing the problem of cryonics cost inflation so as to safeguard the long-term future of Alcor and its members. It concludes with an approach that is presently favored by Alcor's Board of Directors and management.

Option 1: Maintain the Status Quo

This option is mentioned for completeness, but it's really not an option. The

above analysis should make clear that it is financially impossible for Alcor to perform cryopreservations for its present membership decades in the future in the manner that members have come to expect with funding as presently arranged.

Option 2: Just Cancel Membership of Underfunded Members

The Alcor board does not consider this to be a viable option. It would be unfair to unceremoniously cancel members who supported Alcor for many years, and who may have believed that the funding they provided was sufficient indefinitely. Alcor views canceling as a last resort, and would prefer to create alternatives that would Alcor allow to work with each member to avoid this wherever possible.

Option 3: Contribute Some Part of Membership Dues to a Fund to Cover Underfunding

This option has appeal because it would be a way for the dues paid by long-time members to finance their own grandfathering. It may be part of a solution, but it cannot be the whole solution. Even if the entirety of the \$480,000 in membership dues collected by Alcor in 2011 could be devoted to such a fund, the fund could not keep up with the \$4.3 million per year inflationary increase in the costs of cryopreserving all Alcor members. Also, membership dues are presently an integral part of Alcor's operating budget.

Option 4: The 10% Rule

In the 1980s Alcor had a policy of diverting 10% of all incoming revenue to the Patient Care Fund, the forerunner of the Patient Care Trust (PCT). It has been suggested that if this rule had not been

abandoned in the 1990s, or if it were re-instituted, that it might substantially address the problem of grandfathering (12). This is not the case. Even if 10% Rule funds were placed in a fund earmarked to cover all grandfathering costs of cases (which are not just PCT costs), over the past 20 years the 10% Rule would have needed to be close to a 100% Rule to cover the \$19.4 million (and growing) difference between 2011 member funding and the 2011 cost of cryonics.

Option 5: Use Extraordinary Income to Cover Losses from Underfunded Cryopreservations

Although not a conscious policy decision, this has been the de-facto means by which Alcor has survived case underfunding. Grants from wealthy Alcor members over the past decade have helped bridge operating deficits. Windfalls from unanticipated bequests have boosted the value of the PCT, making up for many underfunded cryopreservations. Why not continue to rely on unplanned revenue?

Unfortunately one cannot plan on unplanned revenue. Furthermore, in absence of sound financial planning, past and potential future Alcor benefactors will be hesitant to contribute to an organization that is designed to lose money, and that needs ever-increasing subsidies as membership grows. There is a longer discussion of the importance of long-term planning in Appendix 2.

Option 6: Increase Membership Dues to Cover Grandfathering

In his 2010 econometric analysis of Alcor finances (10), Rob Freitas calculated that dues and CMS fees would have to be increased to \$1500 - \$1850 per year for every Alcor member to sustain the practice of grandfathering. This is likely unaffordable for most present Alcor members. Such a practice might even worsen the underfunding problem by disincentivizing members from providing any more funding than minimum at time of signup. Indeed, most members would need the savings in insurance premiums to pay such high membership dues.

Option 7: Increase Growth

Growth can reduce the percentage of Alcor members who are underfunded by loading the membership with newer mem-

bers who signed up at recent minimums. However if the new members live for decades, this only increases the ultimate burden of underfunding.

Option 8: Reduce Quality of Cryopreservations for Underfunded Members

There are some possibilities for cost savings in the up-front costs of cryonics, such as reducing or eliminating standby services, or omitting cryoprotective perfusion. However even if all up-front costs were eliminated, the largest cost for whole body patients would still remain. It is the required PCT allocation to fund long-term storage. Furthermore, some quality reductions, such as deliberate elimination of cryoprotective perfusion, would result in so much damage that prospects of revival would appear greatly reduced, raising serious scientific and ethical questions.

Option 9: Encourage Members to Arrange Funding Above Minimums

Alcor has attempted to do this, and has been somewhat successful in persuading neuropreservation members to fund above minimums. However whole body members have tended to fund closer to minimums, creating a large long-term problem. Alcor needs to do a better job at persuading members to plan funding consistent with their cryopreservation choices and life expectancy. The following option provides a means for doing so.

Option 10: Establish an Underfunding Reserve Account Funded by Underfunding Charges

After extensive consideration and study, the Alcor board and management believes this is the best idea so far for coping with cryonics cost inflation. An Underfunding Reserve Account would be established. Whenever an underfunded cryopreservation was performed, the Underfunding Reserve would be drawn upon as necessary to pay the PCT, CMS fund, and Operations accounts the amounts they require according to current minimums.

The Underfunding Reserve Account would be funded by annual charges to members proportional to the extent of their underfunding. In the first year of implementation, the charge would be 0.33% of the member underfunding amount (e.g. \$165 for a member underfunded by

\$50,000). The charge would escalate to 0.67% in the second year, and finally to 1% of the underfunding amount in the third year and thereafter. If by the third year no members changed their funding or cryopreservation method, charges collected from all underfunded members would generate \$320,000 per year. This would be a sufficient contribution to the Underfunding Reserve Account to cover the actuarial expectation of underfunded case expenses for the present time. In the longer term, it is hoped that this charge would be an incentive for members to increase their funding with inflation if they are able to do so, and for new members to plan funding according to life expectancy.

A Hardship Fund would be established and seeded by Alcor's general funds to help pay underfunding charges of long-time members who were not able to do so, and to the extent they were unable to eliminate their underfunding by other means (e.g., prepayments, trusts, bequests, conversion to neuropreservation). Alcor would solicit donations to this Hardship Fund, and we would add this fund as an option to which our members could allocate over-minimum funding. Our goal would be to grow this fund to sufficient size to assist all members facing true financial hardship.

An easy mechanism would be provided for whole body members who wished to convert to neuropreservation membership if they were unable to pay underfunding charges related to their whole body membership. If a member became seriously delinquent in paying underfunding charges, automatic conversion to neuropreservation membership might occur under Alcor's authority within the Cryopreservation Agreement.

Alcor management and board believe this proposal is a superior alternative to not cryopreserving long-time members who are underfunded. It begins to address a deep problem with cryonics finance that has been neglected for too long. The board expects to take action on the underfunding issue in early 2012. Comments on this proposal or the problem of underfunding generally are welcome on the [Alcor Member Forums](#). ■

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Appendix 1: What are Alcor's Costs for a Cryonics Case?

In 2011, Alcor's cryopreservation funding minimums are \$80,000 for neuro-preservation and \$200,000 for whole body cryopreservation. These amounts are composed of:

Neuropreservation

\$25,000 to the Comprehensive Member Standby (CMS) Fund

\$30,000 to Alcor Operations for cryoprotection and deep cooling

\$25,000 to the Patient Care Trust

Whole Body Cryopreservation

\$30,000 to the Comprehensive Member Standby (CMS) Fund

\$60,000 to Alcor Operations for cryoprotection and deep cooling

\$110,000 to the Patient Care Trust

The CMS Fund

The Comprehensive Member Standby Fund is a segregated account that Alcor maintains for the purpose of paying for everything Alcor does to respond to cryonics cases outside of the Alcor facility. It includes a readiness component, which pays staff salaries in proportion to the amount of time staff members spend on field work and field work readiness. It also pays the marginal costs of case field work, including transportation, lodging, consumables, and bills when contractors, such as Suspended Animation, Inc. (SA), are used for case field work. CMS is funded by an annual \$180 charge to Alcor members, and by \$25K and \$30K amounts drawn from case funding for neuropreservation and whole body cases respectively. The case funding contributions to CMS are considerably less than the actual costs of a full remote case response, with the shortfall made up by less expensive local cases and cases for which there is no advance notice before legal death.

CMS income and expenses are tracked separately from Alcor's general funds, allowing Alcor to keep close track of whether CMS charges are keeping up with the costs of cryonics case field work.

Alcor Operations

Costs of in-facility work on cryonics cases, comprising cryoprotective perfusion, deep cooling, and placement in long-term care, are paid for from Alcor general funds. They are the only part of cryopreservation costs that presently don't have a separate account. Detailed costs for this part of cryonics include the cost of contract surgeons, consumables, ingredients for cryoprotective perfusate (which can reach \$20K for whole body cases), liquid nitrogen for deep cooling, and depreciation of all the necessary capital equipment. Staff costs also need to be paid.

Gains or losses in this part of cryonics procedures affect Alcor's general operating budget. In 2010 Alcor began charging a \$50K indirect costs charge to cryonics case funding to help balance the general operating budget. This amount is only drawn from case funding after the above-described allocations, including PCT amount, have been paid, and only if case funding is sufficient to pay it. Remaining cryopreservation funding, if any, is distributed according to Attachment 1 of the member's Cryopreservation Agreement.

The Patient Care Trust

The Patient Care Trust (PCT) is a legally separate trust with its own Board of Directors that is charged with maintaining and disbursing funds to maintain long-term care of Alcor patients at cryogenic temperature. At the end of August 2011, the PCT held assets conservatively valued at \$7,000,000 and disbursed approximately \$170,000 a year to Alcor to pay expenses associated with the maintenance of 107 patients (71 neuro, 36 whole body). Those expenses were approximately composed of:

\$50,000 Liquid Nitrogen

\$50,000 Labor (Alcor staff cost billed to PCT)

\$35,000 Rent*, Utilities, Insurance

\$30,000 Depreciation (dewars and infrastructure)

\$5,000 Miscellaneous

*Although the PCT owns the company that owns Alcor's building, Alcor leases space from that company and is reim-

bursed by the PCT for the portion of the building it rents for patient care.

These expenses imply a marginal cost of at least \$10,000 per year for each new storage dewar brought into service, excluding labor. The dewars used by Alcor hold either four whole body patients plus five neuropatients, or 45 neuropatients. The annual marginal cost of maintaining a whole body patient is therefore minimally $\$10,000 / 4.5 = \2200 per year in 2011, or \$220 per neuropatient.

Alcor attempts to set the PCT portion of cryopreservation minimums so that marginal costs of patient care can be met by only a 2% annual draw on principal*. This is to ensure long-term real growth of principal to survive difficult economic times and eventually fund revival and reintegration. This criterion minimally implies a required PCT principal of \$110,000 per whole body patient and \$11,000 per neuropatient. In 2011 the actual PCT allocations of the cryopreservation minimums of whole body patients and neuropatients were \$110,000 and \$25,000 respectively.

There is an item related to the PCT on Alcor's balance sheet called the Deferred Patient Care Reserve. It is computed as (number of neuropatients) * (current neuropatient PCT allocation) + (number of whole body patients) * (current whole body patient PCT allocation). It is intended to be an estimate of the PCT principal required to sustain Alcor's current patient population. It is recorded as a liability, recognizing that responsibility for providing patient care is an obligation. The remaining PCT equity, \$1.5 million in August, 2011, is theoretical excess funding that may be able to grow to fund future revival and reintegration (R&R).

*The 2% annual draw criterion was first articulated in the seminal 1990 article, The Cost of Cryonics. (The article actually imposed an additional safety factor of two, concluding that principal equal to 100 times the annual cost of care should be required.) After abandoning explicit draw criteria for many years, Alcor is attempting to return to a 2% criterion.

Appendix 2: Message from Alcor Board Member Ralph Merkle, PhD, on Alcor Financial Planning

Introduction

Traditionally, Alcor has led a hand-to-mouth existence, scraping by financially by taking in bequests and donations and barely covering its costs. Underpaying its staff and with little or no reserve for emergencies, it has been unable to sustain a coherent research program except for the periods when one or two dedicated members held a research program together by making great personal sacrifices.

The only exception to this bleak picture was the Patient Care Trust Fund, which was the one area where all agreed that we could not adopt a short-term “if we’ve got it, spend it” attitude. As a consequence, the PCT is in financially good condition – though even here we’d like to do better.

Some Alcor members have wondered why rich Alcor members have not donated more money to Alcor. The major reason is that rich Alcor members are rich because they know how to manage money, and they know that Alcor traditionally has managed money poorly. Why give any significant amount of money to an organization that has no fiscal discipline? It will just spend it, and put itself right back into the same financial hole it’s already in.

As a case in point, consider Alcor’s efforts over the year to create an “endowment fund” to stabilize its operating budget. These efforts have always ended with Alcor spending the money on various useful activities. These range from research projects to subsidizing our existing members – raising dues and minimums is a painful thing to do, and the Board is always reluctant to do this even when the financial data is clear. While each such project is individually worthy and has merit, collectively the result has been to thwart the effort to create a lasting endowment and leave Alcor in a financially weak position.

Many have adopted the view that “Alcor has always managed to scrape by, and it always will. Let’s spend any funds that

aren’t needed to cover our immediate expenses and trust to Fortune to provide the funds we need in the future.” The best that can be said about this approach is that it has not yet destroyed Alcor as an ongoing and vital organization. The cost has been the constant risk that Alcor would have to slash staffing to the bone, a constant sense of uncertainty about the future, and fluctuating funding that has exacerbated a stop-and-go approach to projects that has cost us good people and left us building up and then abandoning costly infrastructure.

Successful Endowment Funds

Consider that some of the major institutions in the world, such as Harvard, Stanford, the Howard Hughes Medical Institute and others, have major endowments. You might think that these institutions, because they have been so successful, have been able to create large endowments.

Actually, it’s the reverse. They are great because they have great endowments. The miracle of compound interest means that a successful endowment is an exponentially increasing resource over time. An endowment with a positive rate of return, sustained long enough, will eventually generate steady revenue larger than any desired fixed income stream.

Alcor currently has \$3.5M in its nascent Endowment, and a firm resolve (for once) to spend only 2% per annum of those funds. This 2% per annum was not arrived at lightly – it was the result of extensive discussion by the Board and the best financial advisors available to the cryonics community.

If we draw 2% per annum from the Endowment Fund, it will grow robustly and exponentially. Even without future donations, in two decades it’s likely to exceed \$9M¹. And once our wealthy mem-

bers realize that we have adopted a fiscally sound set of policies, they are more likely to donate money to the Endowment Fund to insure the future stability and growth of Alcor. An Alcor on which their own lives will also depend.

Now consider what happens if we draw just a little bit more: 4% per annum. At that rate, the Endowment Fund might not grow at all.² It might last for decades, but it might shrink instead of grow. It certainly wouldn’t enjoy robust growth. It might eventually disappear.

The long term impact of compound interest cannot be overstated. As we consider longer periods of time, the impact of compound growth rates grows exponentially – it compounds. At a 7% real rate of return with a 2% draw, that \$3.5M in the Endowment Fund we have today becomes \$9M in 20 years, \$24M in 40 years, \$64M in 60 years, and that assumes no one else adds a penny to it. If we add to that initial fund, and encourage its growth, it will be even larger. And eventually it will be large enough to fund whatever is needed to make cryonics work – for all of us.

But we have to have the discipline to add to it, to keep it safe, and to let it grow.

The Grasshopper and the Ant

The first response of many members when they heard we had \$3.5M in our Endowment Fund was “Whoopie! Let the good times roll! All of Alcor’s financial problems are solved!”

Unfortunately, this just isn’t true. At 2% per annum, that \$3.5M adds only \$70K to Alcor’s annual budget. It’s a stable contribution of \$70K that we can depend on being there every year, and that stable \$70K per year is going to grow over time as the Endowment Fund grows, but for this year

² If you draw a higher percentage of your investment annually for your own use (4%), and continue to invest in stocks to get their higher annual returns, then you’ll continue to suffer from the higher risks associated with stocks: you’ll have bad years, and because of your higher draw you won’t be able to recover as easily. Several bad years in a row and you’ll have little money left. But to reduce your risk, you have to avoid stocks, which are risky, and invest in low-risk low-yield securities, which reduce your overall return. If your real rate of return ever becomes negative, you will slowly lose everything. Risk and low real returns are synonymous.

¹ This is based on the assumption of a 7% annual return. The 2% draw reduces this 7% to 5%, giving 1.0520 or a factor of 2.65 growth in 20 years. This results in $\$3.5M \times 2.65 = \$9.3M$, which is “likely to exceed \$9M”. Long term inflation adjusted stock returns vary somewhat, but from 1950-2009 the S&P 500 had an inflation adjusted return of 7% (<http://www.simplestockinvesting.com/SP500-historical-real-total-returns.htm>). Bogle, in “Bogle on Mutual Funds” gives a real rate of return of 6.5% from common stocks from 1871 to 1992.

it adds only \$70K to our annual budget. To give you a feel for the magnitudes involved, our 2010 budget was almost \$1.5M, so \$70K is only about 5% of our budget. Definitely helpful, but a far cry from solving all our problems.

If we want to provide long term stability for Alcor, and don't just want to spend every cent of every donation today, then even large donations don't let us go out and spend money on all the worthy projects and ideas that we all have in mind. We still have to watch our dollars carefully.

But watching our dollars is worth it because a real endowment makes a huge difference to our future, and the difference is this: by adding donations to the Endowment Fund instead of spending them immediately we (a) have a stable source of future funding that we can depend on, instead of a fluctuating source of funding that might vanish in bad years and (b) that stable source of funding will grow exponentially. Over time, that exponential growth will give us the immense resources we need to address the problems that we have to address to make cryonics work.

The damage caused by unstable funding is immense. Assembling the right team for any task usually takes years – and that team can be destroyed with one bad year. Key people leave and can't be re-hired. The best people in any field don't want to work for an organization that's scraping by from year to year, so we won't be able to replace good people when they leave. In fact, we'll have a hard time hiring the right people in the first place. And physical infrastructure can be expensive and hard to maintain. Without proper funding you can't buy it in the first place, and without proper funding for maintenance, it will decay and become unusable.

Conclusion: the benefits of a financially healthy Alcor

We have a dream: an Alcor that is financially healthy. An Alcor that has a large and growing endowment. An Alcor that has the resources to face the inevitable emergencies that will arise which might threaten our patients. An Alcor which has the stability and the resources to attract and retain the best and the brightest in all

the areas and all the fields essential to our future: legal, financial, medical, public relations, managerial, nanotechnology, nanomedical, business, architecture, computer science, and anything else we might need. An Alcor which can give our members the best cryopreservation possible. An Alcor which can provide the most secure long term storage facilities. An Alcor which is respected by the medical community, and which can persuade that medical community to treat our members wishes with the respect we deserve and that we must have if we are to have the best chance at survival. An Alcor which can educate the world in general and the medical, legal, and legislative professionals in particular about cryonics: what it is, how it can save lives, and how it can benefit humanity.

Don't forget the other major task ahead of us: we need to revive our patients. Which means we need to make sure the technology to revive our patients is developed and used. Much as we might wish others will do that for us, it's more likely we'll have to do a lot of this ourselves. Again, the exponentially growing resources that compound interest provides will be essential.

To do all these things, we need a healthy Endowment Fund. To do all these things, we can't lose money in operations and make up for that loss by throwing all our donations and bequests into the breach and never getting ahead. To do all these things, we need to base Alcor on sound fiscal policies. To do all these things, we need to stabilize our finances so they don't fluctuate wildly from year to year.

To do all these things, we need to create the kind of Alcor that gives all of us the best chance of survival. ■

ROBERT ETTINGER: SOME BRIEF HISTORICAL AND PERSONAL NOTES

By Mike Perry

In 1962 Robert Ettinger completed the first version of *The Prospect of Immortality* and began to circulate it, hoping to spur some interest in the idea of freezing the newly deceased for eventual reanimation, or what would later be known as cryonics. (Some earlier terms for the idea were “freeze and wait” and “freeze-wait-reanimate.”) That same year Evan Cooper, working independently (and writing under the pseudonym “N. Duhring” signifying “enduring”), completed his own book, *Immortality: Physically, Scientifically, Now*, with essentially the same idea. (Cooper actually advocated storage in permafrost or a conventional deep freeze but soon would agree with Ettinger that much colder storage in liquid nitrogen was preferred.) The two men corresponded during 1963, while Cooper especially focused on the problem of how to organize a movement, with a non-profit organization called the Life Extension Society, a newsletter, correspondents (in a “letters” column in the newsletter), conferences and the like.

Cooper’s and others’ efforts that year culminated in the first formal gathering devoted to the freezing idea, a two-day event that began on Saturday, December 28. The location was Marty Laffal’s Charcoal Steak House, 1801 H Street N.W., Washington, DC, near Cooper’s residence. One spinoff was the creation of the first cryonics-promotional organization (though again the word “cryonics” had not been invented), the Life Extension Society (LES), whose newsletter first appeared in January the following year, with a recounting of events written by Cooper himself: “The last weekend of 1963 rang down and out with perhaps the world’s smallest conference and time’s most imposing title: *The First Inter-*

national Conference on the Scientific Prospects for Physical Immortality. The number [who attended] depends on how adept you are at counting shadows, waitresses, correspondents, and broadcast reporters. Twenty registered, eighteen paid, while fifteen were able to attend. ...”

The morning session opened with the recognition that “practical aging control, for all the promise of present research, lies in the distant future.” As a consequence, “we should get down to business on a freezing program for those who wish a plan for preservation in the event of any immediate deaths.” The speaker who started things off, Larry Jensen, “who teaches at Castleton College [Vermont], where they call him the ice man, is one of the original formulators of the freeze and wait theory. He has helped spread the idea on radio broadcasts, wrote to President Kennedy in May, gave a talk at Green Mt. College, where the response was highly positive, and has taken out \$10,000 in extra insurance to guaranty [sic] a very cool resting place in the event of death.” (Larry Jensen—Lawrence Neil Jensen—was an artist, author and professor who is listed repeatedly in the LES newsletter as a contact. But after the first conference and despite the insurance policy, he does not seem to have had much active involvement or longstanding interest in cryonics; he died in 2000, with no report of cryopreservation. Ev Cooper, for his part, was active for a few years but then dropped out and was lost at sea in 1982. Ettinger, of course, maintained his interest and involvement throughout and was finally cryopreserved this summer at the age of 92.

“Bob Ettinger led the afternoon session,” Cooper goes on, “... primarily a



continuation of the morning’s attempt to find and agree on a program.... There were the usual differences of opinion on both days with such strong-minded individualists. However the name *Life Extension Society* was adopted until and unless a better one can be found.” Cooper also mentions Ettinger’s book, *The Prospect of Immortality*, whose expanded, commercial version was nearing publication. This would occur in June, 1964; the August issue of the LES newsletter has a report, reprinted below with minor corrections.

BIG NEWS OF THE SUMMER:

“Bob Ettinger’s book *The Prospect of Immortality* was released by Doubleday June 5th, coinciding with a short serialization in *Cosmopolitan*, and a thoughtful article by Fred Pohl in *Playboy*. Quite a number of radio and TV stations carried and are continuing to carry interviews of Ettinger and discussions of the freeze-wait-resuscitate idea. Bob’s book has been translated into French, and LES members report seeing it in paperback on Paris newsstands.

“The book itself is a marvel of lucidity and forceful writing. Among the many contributions, the emergency dry ice freezing and storage suggestion is of special interest because the next step [after vital signs cease] is the actual preservation by freezing of [the] person who has just “died.” The dry ice method is an emergency method, for it is preferable that the lower tem-

THE 22ND CENTURY BOY

By Mark Plus

The place: Tulsa, Oklahoma.
The time: Summer, 1974.

A 14 year old boy, interested in both science fiction and science, had watched a TV series popular in the early 1970s called *The Six Million Dollar Man*. The show's premise? An astronaut named Steve Austin, an appropriate hero for the era, had crashed an experimental craft and suffered severe injuries, losing both legs, an arm and an eye. U.S. government scientists with unlimited funding at their disposal decided to rebuild this astronaut using a technology called "bionics"; they restored his limbs with artificial replacements which made much him faster and stronger than an ordinary human, and they gave him super-vision with an artificial "bionic eye." The series then showed this enhanced man's adventures as a kind of secret agent, where his bionic powers gave him the edge in every sticky situation.

How fantastic, this teen boy thought, how cool! Would that he could live to see the day when everyone had such superhuman powers, himself included! He had even started to look for books about creating such "bionic" people in the library.

One hot summer day that year, this young man walked the half mile from his home to the Skaggs drugstore and super-market on the corner of 31st Street & Garnett in east Tulsa to look over the paperback books, at a time when serious books still appeared in mass market paperbacks after their hardcover releases. He noticed the cover of a paperback with unattractive psychedelic artwork (which had already started to look dated by 1974), titled *Man Into Superman*, by someone named R.C.W. Ettinger. The caption above the title said, "The Startling Potential of Human Evolution. . . And How to Be Part of It." The caption below the artwork said, "How Would You Like to Live for Centuries? Develop an Infallible Memory? Become Impervious to Cold, Heat, Hunger, Thirst? It's Possible. . . Per-

haps Even Inevitable. . . And It Can Happen to You!"

The boy then opened the book to the Preface and read, "By working hard and saving my money, I intend to become an immortal superman."

How could this boy resist buying and reading such a book? So he bought it without hesitation, took it home, studied it backwards and forwards over the next few weeks and pondered its implications.

He soon realized that this Mr. Ettinger, apparently a very smart man, had provided some missing pieces which could make becoming a real-life Steve Austin a practical proposition. Obviously the superhuman would need upgrades so that he doesn't age and could live for a really, really long time. But we didn't have the technology to do that in the 1970's, as we still don't in 2011. So, Ettinger argues, people alive now need a way to reach the time when they can benefit from such technologies, and he presents the idea of cryonic suspension as the means, often referencing his earlier book, *The Prospect of Immortality*, which the boy didn't have access to at the time.

Moreover, Ettinger describes one mind-blowing idea after another about the potentials and lifestyle options for "immortal supermen" in a long, long future, speculations usually based on the scientific literature of the time which he provides references to in the back of his book.

As unlikely as it sounds, the experience of reading that book transformed this boy's outlook on life and in effect projected him mentally decades and even centuries ahead of his contemporaries, much as Mr. Ettinger had intended.

To make a long story short, that 14-year-old boy grew up into a cryonics activist, namely, the author of this reminiscence of his first encounter with Robert Ettinger's many life-transformative ideas. I signed up with Alcor in 1990, and I have

done a little here and there over the years to keep Mr. Ettinger's vision alive.

I even got to meet Robert Ettinger and his wife Mae once at cryonicist Don Laughlin's ranch near Kingman, Arizona, in 1994. I told Mr. Ettinger how much *Man Into Superman* meant to me, and how I thought he deserved more credit for anticipating the "transhumanist" movement which had started to organize around the internet by that time. Mr. Ettinger gave a talk to the cryonicist guests at the ranch about how he came up with the cryonics idea and found a publisher for his first book, and I appreciated his earthy realism about human nature and the obstacles it presents to making cryonics socially acceptable. In addition I talked to Mae Ettinger, and asked how to buy a copy of a book she had published. (Amazon hadn't gone into business yet.) She graciously mailed me a copy later.

I regret that I couldn't get to know Mr. Ettinger better personally on this side of the gulf of time which cryonicists have to cross to reach the era of "immortal supermen." If both of us make the journey safely, I hope to talk to Mr. Ettinger again, and to ask him what he thinks of "the future" he had organized his life thinking about and had implicitly invited me to share with him. Even if what I call Future World has aspects we might find unsatisfactory, confusing or alienating at first, assuming that we have plenty of time ahead of us, we can probably create worthwhile lives for ourselves and not regret our one-way migration across the centuries, especially as we revived cryonauts renew our relationships and look out for one other; I would certainly try to help Mr. Ettinger in that situation as repayment for what he has given me. As Mr. Ettinger argues in his writings, we will probably have superior adaptability working for us as part of our basic endowment at revival. What does "immortal superman" mean, after all? ■

BOB ETTINGER AND THE CRYOBIOLOGISTS

By Charles Platt

His contributions are obvious: His seminal book energized activists from Curtis Henderson to Bob Nelson, and precipitated the first cryonics cases. Without him, would cryonics even exist?

I have often wondered how cryonics would have developed if Bob Ettinger had not been around to champion the cause. His contributions are obvious: His seminal book energized activists from Curtis Henderson to Bob Nelson, and precipitated the first cryonics cases. Without him, would cryonics even exist?

We should remember that Ev Cooper (writing as “N. Duhring”) came up with the idea separately and circulated his manuscript *Immortality: Physically, Scientifically, Now* two years before Doubleday published its edition of Bob’s book in 1964. Cooper’s Life Extension Society could legitimately claim to be the first cryonics organization, although of course it was only a discussion group. Karl Werner had not yet come up with the word “cryonics.”

Looking back farther, British scientists Alan Parkes, Christopher Polge, and Audrey Smith evidently considered the possibility of human cryopreservation in the 1950s. Their success in cryopreserving red blood cells and bull semen led Parkes to remark, in an article in *Scientific American*: “Inevitably, we were drawn to a still more fascinating question: Could a whole animal survive freezing?” Smith subsequently pursued the reversible cryopreservation of hamsters, and Greg Fahy once showed me a paper coauthored by her that discussed the challenge of rewarming larger mammals. I don’t think it was coincidental that an illustration suggested something big enough for a human being.

Going back farther, the implications of stopping and restarting life processes were explored in Luyet’s book “Life and Death at Low Temperatures,” based on his pioneering work in the 1930s and 1940s. And still farther back, in 1862, a novel titled “The Man with the Broken Ear” by French author Edmond About described a person

being revived after being preserved by desiccation. Bob Ettinger once told me that he was aware of this novel.

Clearly, cryonics was a concept that was ready to happen. Bob’s singular achievement was that he used the media to popularize it, encouraged its first application to human beings, and led an organization that pursued it with truly remarkable persistence.

I once asked him if he felt that media coverage for cryonics in the 1960s had scared cryobiologists away from their prior work on organ cryopreservation. He readily agreed that the early cryonics cases unnerved the scientific community, but of course he tended to blame them for their lack of courage and vision.

I had significant differences with Bob, most notably in the mid-1990s when the protocol at CI appeared to violate basic cryobiological principles for minimizing ice formation during initial cooling. (CI has subsequently made great efforts to use rapid cooling, as opposed to the slow process that was applied previously.) Bob scoffed at me for paying attention to anything a cryobiologist would say, but I think mostly he felt that their concerns were irrelevant. He seemed to believe that future science would be able to fix pretty much anything. When he moved to Phoenix for a while, I was told by someone at Alcor that he politely declined their offer of local standby help in the event that he might need it. As always, he placed his trust in a local mortician, a shot of heparin, some chest compressions, and a few bags of ice.

This optimism inevitably put him at odds with the scientific community. We can only wait to find out whether he or they will have the last laugh.

For myself, I hope that his optimism was not misplaced. ■

COST OF REVIVAL AND REHABILITATION

By Robert Ettinger

Reprinted from *Physical Immortality* 3rd Qtr 2003, 12, published by the Society for Venturism

The only people likely to be qualified to make cryonics-related decisions, and without any conflicts of interest, are the Boards of Directors of the cryonics organizations.

Mike Perry and David Pizer have kindly asked me to write something for the *Venturist* magazine. Instead of waving a flag or blowing a trumpet again, I think this time I'll limit myself to a practical question that arises fairly often—whether the average member will be able to afford revival and rehabilitation, even if the technical capability becomes available. There have been many inquiries received by all the organizations, and many articles written, about how to set aside earmarked funds for an individual patient, for use in revival, rehabilitation, and life afterwards. The recommendations usually involve a trust fund in a jurisdiction that does not have the Rule Against Perpetuities, that can go on as long as necessary. States sometimes mentioned include South Dakota and Delaware, and foreign countries have included Liechtenstein.

We at Cryonics Institute don't discourage such trusts, and we can supply the names of attorneys outside of CI with experience in this area, but I personally see more problems than potential in this approach.

First, you need a trustee or trustees, and successor trustee(s), willing and competent to do the job. Rotsa ruck. The "job" includes managing the investments and also making decisions, if necessary, concerning possible emergencies such as a cryonics organization suddenly being strapped for money. Or a decision might be needed as to which revival procedure to use, or which type of rehabilitation, and so on. The only people likely to be qualified to make cryonics-related decisions, and with-

out any conflicts of interest, are the Boards of Directors of the cryonics organizations.

If a bank or similar institution is a trustee, or is hired by the trustee to manage the investments, you are likely to get mediocre returns for substantial fees, the net result being less than mediocre returns. If the bank also has authority over other types of decisions, you are really sticking your neck out.

Don't forget also that laws and regulations can change. Delaware recently rescinded most aspects of its rule against perpetuities, but nothing guarantees that they won't do another 180-degree turn some time in the future. If you have a Delaware trust at that point, your trust will be stuck at minimum with substantial attorney fees to deal with the new situation. If your money is just in your organization's general fund, it remains as safe as the organization is.

Some of us at CI, Mae and myself included, have decided long since that our best bet is just to give CI the bulk of our estates (whether by bequest or otherwise or a combination). This will NOT earmark the funds for our own exclusive personal benefit, but will strengthen the organization and hence improve the chances of all our patients.

As a small bonus, the CI contract also specifies that, other things equal, if not all benefits can be supplied to all patients at the same time, then those funded at higher levels will have priority consideration. For example, if at a particular time the cost of revival and rehabilitation is too high for all eligible patients at once, then those funded

at minimum levels might have to wait longer.

This approach rubs some people the wrong way, partly on an “ideological” basis. They think it smacks of communism or something if everyone doesn’t pay his own way separately. But that is simplistic thinking. For one thing, few of us demand that every member of a family “pull his own weight” without exception; the stronger or luckier are willing to help the weaker or less lucky. And in the end this doesn’t necessarily mean a sacrifice by the stronger, since it is the group strength that will ultimately prevail or fail. Nor must we underestimate the importance of morale, which is stronger if we all pull together.

Remember too that your chances are correlated with the rate of growth of your organization, and that is sensitive to the timing of contributions. Something now is more important than something later. If you are willing to trust your person to your organization, you should also, it seems to me, be willing to trust it with your money, which is less important.

But the question remains, where will the money come from for revival and rehabilitation, for CI patients? The answer comes in several parts.

First, we figure a minimum of \$20,000 per patient invested for income to pay for ongoing care. At revival time, that money will be freed up for revival and rehabilitation.

If you are willing to trust your person to your organization, you should also, it seems to me, be willing to trust it with your money, which is less important.

Next, we expect CI’s assets to grow, partly by participation in the growth of the wealth of society as a whole, and partly through growth in membership and other kinds of revenue. Barring calamity, those assets should eventually reach any required amount.

Looking at it in a slightly different way, any technical procedure should diminish in relative cost over time, in most cases eventually to near zero. At an earlier time in history, paper clips were expensive, but no one today would demand payment for a paper clip. Today some people pay money for bottled water, but almost anyone will give you a glass of tap water without charge.

Further, there have always been some do-gooders around, and this is likely to increase, not decrease. Doctors Without Borders and all that. At some point the cryopreserved will be legally reclassified, no longer “deceased” but suspended, with all that implies about moral and legal obligations. And many of us, if not most, will have friends and relatives willing to go to bat for us, even some outside of the cryonics organizations.

Remember too, that many members will be suspended many years from now, perhaps by much improved methods, which may mean much less expensive revival.

As usual, nothing about the future is assured. You consult your own value system, if you have one (unlikely), then you make your estimates and place your bet and take your chances. ■



Alcor Member Forums

Discussion board of the Alcor Life Extension Foundation

Discuss Alcor and cryonics topics with other members and Alcor officials.

- The Alcor Foundation
- Cell Repair Technologies
- Cryobiology
- Events and Meetings
- Financial
- Rejuvenation
- Stabilization

Other features include pseudonyms (pending verification of membership status) and a private forum.

<http://www.alcor.org/forums/>

CAN YOU BUILD A LOCOMOTIVE OUT OF HELIUM?

ROBERT ETTINGER ON SUBSTRATE-INDEPENDENT MINDS

Introduction and Afterword by Ashwin de Wolf

Introduction

Robert Ettinger, the “father of cryonics,” was cryopreserved on July 23, 2011. While Ettinger’s book *Man into Superman* (1972) is considered an important contribution to transhumanism, he increasingly came to recognize that most people do not desire a hard break with the past and resist radical transformation. During the last years of his life he became a vocal critic of ‘mind uploading’ as a means of personal survival and spent a considerable amount of time refining his arguments why mind uploading is not likely to work. This document organizes excerpts from his last book *Youuniverse* and mailing list messages on the topic of substrate independent minds. In the afterword, I make a brief attempt to place his contributions in a broader philosophical context.

The title of this document refers to a message that Robert Ettinger sent to the Cryonics Institute mailing list on July 21, 2011. In response to the claim that the human mind is a machine, and that the function of any machine can be duplicated by a machine built of another material, Ettinger asked, “*Can you build a locomotive out of helium?*”

Mind Uploading

“A large and burgeoning group of scientists, including some of the brightest, believe that—in principle—computers will fairly soon be able to *think* in the fullest sense of the word. They will be living, conscious entities with feelings and subjective experiences.

“A corollary—many believe—is that your persona could be uploaded into a

computer and *you* could then live an incomparably bigger and better life as a simulation or emulation.

“I think the uploading thesis is probably wrong, although (as usual) it’s too soon to be sure. But the issue is a significant part of modern philosophy, and potentially has enormous practical importance.

“...I am among the radicals in the expectations for AI. But intelligence is not life. It is by no means proven that life as we know it with subjective experience can exist on an arbitrary substrate, such as silicon.” (*Youuniverse*)

Information

“One extreme school of thought holds that *information* and its processing constitute everything that is important. In particular, *you* are essentially just a collection of information, including a program for processing that information. Your ‘hardware’—the nervous tissue that embodies and handles the information—is only secondary.

“My conclusion will be that it is *not* necessarily possible—even in principle—for consciousness to exist on an inorganic substrate, and in fact that it is unlikely.

“Sometimes the doubters are accused of dualism—the increasingly discredited belief that the living and inanimate worlds, or the material and the spiritual worlds, are separate.

“This certainly is not true of me or of many others who question the information paradigm. I am a thoroughgoing materialist and reductionist. I will not feel in the least dehumanized if it turns out the information paradigm is right...I have strong

doubts, but they are based entirely on the evidence, or lack thereof.

“The most radical of the ‘strong AI’ people believe that all thinking is information processing, and all information processing is thinking; and they appear to believe that consciousness is just an expression of complexity in thinking.

“People who talk this way must be admired for boldness and strength of conviction, but I think not for clarity of thought.

“The point is, all physical phenomena, all interactions, involve information processing in some sense. But that isn’t *all* they do. A computer, or a person with pencil and paper, could figure out—describe or predict—what the atoms do, and that would be an analog of the information processing part of the phenomenon; but only the actual, physical atoms can form an oxygen molecule. And to anthropomorphize or analogize ‘feelings’ and ‘thoughts’ into these phenomena is simply unjustified. It amounts to declaring, by fiat, that thinking and feeling are inherent in information processing; but saying so doesn’t make it so.” (*Youuniverse*)

Turing Tests and Zombies

“Alan Turing was a brilliant mathematician and computer pioneer. He played an extraordinary part in winning World War II through his work in cryptography for British Intelligence. He also showed many of the potential capabilities of general computers. But one of the works for which he is most famous is badly flawed or has been badly misused—the ‘Turing test’ for intelligence/-consciousness.

“Again, I am a firm materialist and reductionist: I readily concede the possibility that a machine could (conceivably) have life and consciousness. But I deny that we can *assume* that (inorganic) machines have this potential; and with still more help from Turing I think I can make the case persuasive.

“Uploaders’ or ‘upmorphists’ or patternists generally maintain that our identity resides in our information content. Their most extreme position is patently absurd—that ‘we’ literally persist, in some degree, if any of the information about us is preserved, even our writings or biographical data. (Shades of Woody Allen! ‘I don’t want to live on in my works; I want to live on in my apartment.’) Anyone who believes this needs more help than I can provide.

“Turing ingeniously showed that a strip of paper tape marked in squares, with zeroes or ones marked on the squares according to certain rules, along with a simple mechanism for moving the tape and making or erasing marks, could be a universal information processor—i.e., it could accomplish any information processing task that any digital computer (serial or parallel) could do, given enough time. It could even produce any result that a quantum computer might, albeit at a teeny-tiny fraction of the speed.

“You certainly can’t claim that a paper tape (even when it is moving) is alive or conscious! Yet that tape, in theory, could produce any response that a person could to a particular stimulus—if by ‘response’ we mean a signal sent to the outside world, suitably coded. It could converse with perfect fidelity to an individual’s character, and over a teletype could fool that person’s husband or wife.

“My original objection to the uploading assumption was simply that we don’t know anything about consciousness or feeling, hence it is premature to assume that it can exist other than where we know it exists, viz., in organic brains. It is entirely possible that meat machines (as opposed to machines of silicon or metal etc.) have some unique quality that allows the emergence of feeling and consciousness. Until we can isolate and define the mechanisms of feeling—of the subjective condition—

we must reserve judgment as to the possibility of inorganic people. (*Youniverse*)

“Uploaders tend to put faith in the Turing Test for human intelligence, and to believe that zombies cannot exist. Let’s take a quick look.

“Communicating (say) by email, a tester tries to determine whether the testee is a human or a computer program. Passing the test supposedly proves the testee is human or equivalent. But the test is clearly worthless, since it produces both false positives and false negatives. As much as 50 years ago Eliza, a program pretending to be a psychiatrist, fooled many people—false positives. And of course a child or a retarded person could perform below par and produce a false negative. The Turing test is baloney.

“In similar vein, uploaders tend to believe that something which outwardly behaves like a person must be a person. They reject the possibility of zombies, systems that by their actions appear to be sentient but are not. Yet it is often easy to fool people, and, as already noted, programs have fooled people even though no one claims the programs were alive.” (*Cryonics Institute Mailing List, September 9, 2010.*)

Imperfect Simulations

“...any simulation created in the foreseeable future will be imperfect, because it will necessarily reflect current theories of physics, and these are *known* to be incomplete and almost certainly in error to some extent or in some domains. Whether this would necessarily result in *material* deviations of the simulation from the course of nature, and in particular whether it would preclude feeling, we don’t yet know. But we do know that the simulation would be wrong, which in itself is enough to justify withholding judgment on the possibility of living computers.” (*Youniverse*)

Analog Failures

“The uploading thesis depends on the assumption that any organic process in the brain can be duplicated by analog in some other medium but this not only isn’t obvious; it’s nonsense.

“For example, suppose a certain process depends on magnetism, and all you

have to work with are the mechanical forces transmitted by rigid bodies. Can you make an electric motor out of tinker toys? Can you build a synchrotron out of wooden boards and nails? Uploaders think a computer (of the electronic variety) can be a person: how about a Babbage mechanical computer made of rods and gears? Presumably, any kind of information processing and storage can be done by a collection of rods and gears but could rods and gears conceivably be conscious? I doubt it; not all media are created equal. So it is entirely possible that organic brains have potentialities not realizable anywhere else in the universe.” (*Youniverse*)

“Just ask yourself what consciousness is—what physical condition or process constitutes consciousness. You don’t know, hence you cannot know that a simulation fills the bill.” (*Cryonics Institute Mailing List, September 16, 2010*)

Petito Principii

“It seems to me that all the computer-metaphor people... keep making the same error over and over again—assuming as a premise the very hypothesis they are trying to establish. When the premise is the same as the conclusion, naturally the conclusion follows from the premise. They refer repeatedly to ‘all computational devices’ etc., implying that the brain is just that—another computational device—when in fact that is precisely what is at issue: Is the brain possibly something more than a computational device? The computer metaphor is plausible (and I am not in the least uncomfortable with it) but plausibility isn’t proof.” (*Youniverse*)

The Map is not the Territory

“Adherents of the ‘information paradigm,’ I believe, are deceived in part by glibness about ‘information’ and hasty ways of looking at it.

“Apparently it needs to be said again and again: a description of a thing or a process—no matter how accurate and how nearly complete—is not the same as the thing or the process itself. To assume that isomorphism is enough is just that—an assumption, not self-evidently permissible.

“Even though (for example) a computer program can in principle describe or predict the behavior of a water molecule in virtually all circumstances, a water molecule for most purposes cannot be replaced by its description or program. If you pile up 6.02×10^{23} computers with their programs, you will not have 18 grams of water, and you will have a hard time drinking it or watering your plants.” (*Youniverse*)

“Eliezer Yudkowsky (and other uploaders) claim that mapping a system results in a map that effectively has the same properties as the original. Well, look again at one of my counter-examples. I write down with pencil and paper the quantum description of a hydrogen atom in its ground state. It could hardly be more obvious that the marks on paper do not constitute a hydrogen atom. And if you put side by side two papers describing two hydrogen atoms, they will not combine to form a hydrogen molecule. In principle, of course (the math is difficult) you could write down expressions corresponding to the formation of hydrogen molecules from hydrogen atoms, but you will still have just marks on paper.

Once more, a simulation is just a coded description of a thing, not the thing itself.” (*Cryonics Institute Mailing List, September 18, 2010*)

Identity

“The term ‘identical’ is used in different ways by different people. To some, two systems are identical if they differ only in location, e.g. two hydrogen atoms in ground state. But I have pointed out that a difference in location necessarily implies other differences as well, such as gravitational fields. Hence my position is that, if the question arises, are A and B identical, then they are not.

“If two systems differ in spatial or temporal location, then they may be identical to most observers for most purposes, but survival of one does not imply survival of the other. Suppose you, as you are now according to local observation, also exist at a great distance in space or time (either past or future), just by accident. I see no reason for the survival of B to imply the survival of A.” (*Cryonics Institute Mailing List, September 16, 2010*)

Afterword

Robert Ettinger presented a number of distinct arguments (no fewer than fifteen, by his own count!) against mind uploading and I cannot pretend to have presented them all in this document. I think there are a number of core positions associated with Ettinger’s argument that can be stated quite succinctly, however.

1. Whether mind uploading is possible is ultimately an empirical question and cannot be settled conclusively by analogies or thought experiments.
2. A description of a material object is not necessarily the same as the object.
3. A simulation *must* be erroneous because the program necessarily is based on our incomplete knowledge about physics.
4. Consciousness may be substrate-dependent.
5. A copy of a person may not constitute personal survival.

The common denominator that runs through Ettinger’s critique of substrate-independent minds is a thorough empiricism about knowledge. Ettinger does not categorically rule out the feasibility of mind unloading but takes people to task for dogmatic claims on these topics in absence of empirical corroboration.

Ettinger was particularly irritated by the claim that materialism commits a person to the acceptance of mind uploading. He could not see how a rejection of the soul excludes the view that certain materials are uniquely suitable, or even *exclusively* suitable, for a certain function. One might add that it is even conceivable that the mind is substrate independent but that existing organic chemistry provides the most versatile basis for advanced consciousness and survival.

Most of the issues that Ettinger was concerned about may be resolved by the time he will be resuscitated but it is possible that some of the issues that are at stake in this debate are ultimately un-falsifiable or even pseudo-problems. For example, how

could we settle the question of whether a copy is “really you?” Obviously, a copy of something will always confirm that (s)he is really him- or herself but that is of little help in resolving the question. Similarly, we may never be able to conclusively verify (or falsify) that a computer has consciousness or feelings. Is it even conceivable that new super-intelligent life forms will replace humans without being conscious or having feelings! Evolution selects for fitness, and whether this implies consciousness is an open question.

So who is right, Robert Ettinger or his critics? I think what captures Ettinger’s perspective the best is to say that if you expect an answer *right now*, you have not paid close attention to his argument. ■

Q4-2011 Readiness Update

By Aaron Drake, NREMT-P CCT

TSA Known Shipper Certification:

On Aug. 3, 2007, President Bush signed into law the *Implementing the 9/11 Commission Recommendations Act of 2007* (9/11 Act) P.L. 110-53 (2007), legislation requiring the Secretary of Homeland Security to establish a system to enable industry to screen 100 percent of cargo transported on passenger aircraft at a level of security commensurate with the level of security of passenger checked baggage, within three years. The impact of the 100 percent screening requirement is that all cargo must be screened at the piece level by TSA approved methods prior to being loaded onto a passenger aircraft.

The Known Shipper Data Management System provides a systematic approach to assessing risk and determining the legitimacy of shippers by allowing TSA to identify and approve the Known Shipper status for qualified shippers located in the U.S.

Alcor has completed the process to obtain “Known Shipper” status with the Transportation Security Administration. While we will still use a mortuary with similar status to arrange for the shipping of our patients, we now have the ability to ship/return our response kits through the airline’s cargo division to save on costs and inspection delays. This will prove beneficial for both domestic and international cases.



**Transportation
Security
Administration**

ATIB – Airline Transportable Ice Bath

Alcor staff has been busy designing and building a lighter, more compact and



highly durable Airline Transportable Ice Bath. The original design was very bulky and challenging to move around the country. In addition, the cost associated with shipping just this one component of Alcor’s response kit was as much as \$600 each way on many airlines. By reducing both the size and weight of the package to make it more suitable for airline transportation, it also became more manageable to handle in the field. Alcor’s Readiness Coordinator Steve Graber designed the new unit in 3D CAD design software SolidWorks prior to working with Randal Fry on the in-house fabrication.

We intend to continue using the current Portable Ice Bath for all of our regional response teams. It is a very well thought out and fully functional product when airline shipping is not a concern.

Our new ice bath is not only around 1/2 the weight, but also probably about 1/8 the size when folded down for transport.

Emergency Communication

One of the fastest growing segments of mobile technology is location-based services that utilize the GPS component of your cell phone to pinpoint your location. Many popular applications that use this feature include finding a lost or stolen phone, identifying local businesses, data stamping photos, turn-by-turn directions, among a multitude of other creative functions.

The mobile apps that address a common concern among cryonicists are those that deal with personal safety. If you are in trouble, you can notify emergency services, or other pre-determined individuals, just by pressing a button on your phone. This action will send a distress signal with a personalized message that includes your GPS/Network coordinates. One such application, *Emergency Button*, can notify Alcor’s emergency response line—TeleMed—to alert us that you have a medical emergency. By pre-programming your name and Alcor

number into the body of the text, it will send an emergency email to TeleMed that provides your exact location. Alcor's Deployment Committee can then monitor the seriousness of your health and determine if and when a standby may be warranted. Other applications, like *ICE: In Case of Emergency and Emergency Life Tracker* have similar actions and can be found in the Android Market.

Remember that communication is a two-way street. In order for Alcor to remain vigilant with respect to monitoring your health, we have to first learn of your medical condition in order to plan our response and resources appropriately. If possible, notify us when you first learn of a health concern or before a pending surgical procedure. As mobile technology continues to advance, Alcor plans to embrace these new developments to increase the ease with which members can alert us of a potentially life threatening situation.



Alcor's 107th Patient:

An Alcor member living in Southern California was diagnosed with a glioblastoma multiforme in 2010, by far the most common and most aggressive malignant type of brain tumor. A mini-med kit was prepared and shipped to the member's home, where she had 24-hour home health care. Arrangements were made with her

medical providers to pronounce immediately, begin cooling and administer stabilization medications, in the event clinical death occurred unexpectedly and prior to having a response team in place.

As her health began to decline in June of 2011, Alcor began to actively monitor her situation. Suspended Animation's response team was requested to provide standby and stabilization when required. Aaron Drake arranged for a charter flight and made special arrangements with the local Health Department so that we could call after-hours to secure a transit permit, to guard against needless delays in the event the Health Department's administrative office was closed for the night, or worse, the weekend. Aaron also visited the home and member in mid-July, met with a nearby mortuary and worked out logistical details.

Suspended Animation initiated a standby on August 9 with at least two team members on site at all times. On August 18, 2011, after nine days of standby, the member was pronounced at 4:12 pm. The patient was cooled remarkably quickly over the first hour after cardiac arrest with the assistance of Suspended Animation's cardiothoracic surgeon who, by all accounts, performed superbly. As the time of the pronouncement was late in the afternoon, no one was answering the phone at the Health Department, but due to the careful pre-planning, the private, after-hours number generated a quick response and we were able to obtain the needed documents without delay.

The charter flight was set in motion; however a dust storm in Scottsdale/Phoenix delayed its departure—fortunately only briefly. The patient was loaded on the plane at 8:57 pm, and reached Alcor at 10:22 pm. The surgery was challenging due to extensive medical issues, but target cryoprotectant concentration was reached in the brain.

Member A-2091 is now Alcor's 107th patient. ■



About the Author

Aaron Drake
NREMT-P, CCT, Medical Response Director

Aaron Drake is a Nationally Registered EMT-Paramedic (NREMT-P) and a Certified Cardiovascular Technologist (CCT) who serves as Alcor's Medical Response Director. In this position he is responsible for the standby, stabilization and transport operations of the Alcor Foundation. Aaron worked as a paramedic firefighter for 14 years in his hometown of Lincoln, Nebraska. He has served with FEMA's Urban Search and Rescue program for emergency preparedness planning and has performed rescue and recovery efforts in response to national disasters. Aaron holds a Bachelor of Science degree in Business Administration from the University of Nebraska.

MEMBER PROFILE:

GREGORY BENFORD

By Chana de Wolf

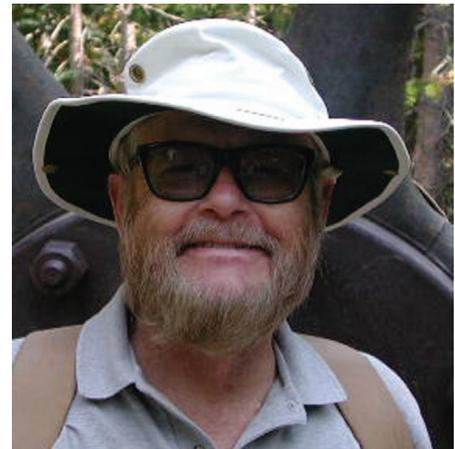
It may come as no surprise that many cryonicists are avid science fiction fans. After all, cryonics is only necessary because we can't already reverse aging and cure lethal diseases, so being on board to see the (possibly far-distant) future is requisite. Indeed, cryonics is somewhat of a science fiction staple, and such stories have inspired a select few readers to investigate real-world cryonics since the very first writers began freezing characters as a means to move futuristic plots forward. But one of those writers is a cryonicist himself, and his name is Gregory Benford.

Benford, a professional research physicist since 1967 and professor at UC Irvine since 1971, also discovered cryonics through his love of science fiction, having read some of the early classics like *The Door into Summer* and *The Age of the Pussyfoot*. But he didn't learn of Alcor until the Eaton Collection annual conference on science fiction in 1992. The theme that year was life extension and immortality in science fiction and fantasy—a topic which piqued

Gregory's curiosity. Since the event was held at UC Riverside near the Alcor facility, he and fellow science fiction writer Joe Haldeman left the conference and took a tour. "[Alcor] impressed me with its realistic style of doing what one can now, despite the many unknowns," Gregory remembers. "I was about 50 and realizing how the mortality wall was coming up on my horizon. That led me to write my longest novel, closely modeled on the Alcor experience."

That novel, *Chiller*, Gregory wrote while immersed in the study of cryonics. Under pressure from his publisher, Bantam, it was published under the pseudonym 'Sterling Blake' in 1993 just after he had executed his arrangements with Alcor. Set around the UC Irvine campus and its medical school, the novel is based on Alcor and well-known figures in Alcor history such as Mike Darwin, Saul Kent, Steve Harris, Mike Perry, David Pizer, Hugh Hixon, Arthur McCombs, Ralph Whelan, Max More, Fred and Linda Chamberlain, Dr. Thomas Donaldson, and Jerry Leaf. "Studying the odds and thinking through the grand sweep of what the 21st century could bring, I saw that joining Alcor and getting a cryonics contract seemed like a calculated gamble, worth the price," he says. "Still does."

As a writer of "hard" science fiction – that based on science fact and often incorporating his own research in plasma turbulence theory and astrophysics – Gregory embraced the opportunity to write a novel that allowed him to call attention to cryonics and to educate readers about the real science behind "freezing people." To that end, he is currently in the process of reissuing *Chiller* under his own name with some updating and rewriting, plus a long afterword. "There's an enormous social weight



Gregory lives life passionately, with a particular zest for "the banquet of life," hiking and traveling.



Gregory participating in discussion at the National Academy of Sciences in 2010.

leaning against us, working to ignore our approaching demise," he notes. "Facing it demands courage. Maybe *Chiller*...will help in the struggle."

Gregory may have been reading science fiction since he was a kid and writing it since the 1960s, but it was his first wife's long battle with kidney disease all through the 1990s and her death due to cancer in 2002 that impressed him with the terrible burden that death places upon humans, causing him to think about the possible alternatives. "What would humans be like if not under this incessant threat?" he wondered. The answer to that question, he determined, "was definitely worth seeking and cryonics is the stop-gap measure that might get us there."

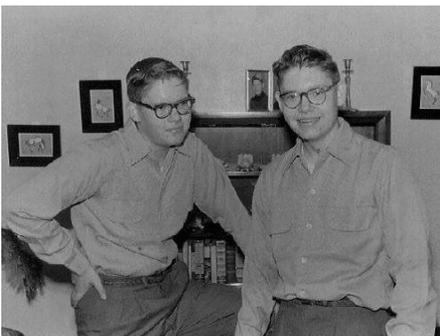
Understandably, recovering from his wife's death was very difficult, taking Gregory through years of depression. His wife had refused to be cryopreserved, so he knew he would never see her again.



Astrophysicist Gregory Benford, Ph.D., is an Alcor member and science fiction writer. He teaches physics and astronomy at the University of California, Irvine.

He thought long and hard about how to *do something* to improve human health and extend the healthy portion of the human lifespan. And then he did it.

“In 2006 I started Genescent, a firm dedicated to extending heathspans *now* using genomics, well ahead of the sluggish big pharma drug route,” he explains. “Our first product, STEMCELL100 (<http://www.stemcell100.com>), upregulates repair genes in our cardiovascular system, increasing fitness. There are more products built on the same strategy coming.”



Gregory Benford with his identical twin brother, Jim Benford, in 1956.

In fact, Genescent is set to tackle the biggest threat to human health of all – neurodegenerative disease. Brain-threatening diseases such as Alzheimer’s and Parkinson’s are notoriously difficult to treat. The

brain is well-protected by the blood-brain-barrier (BBB), making drug delivery difficult. And even therapeutic drug treatment ultimately cannot stop the onslaught of degeneration. So far, there is no cure. This bleak state of affairs begs us to take a different approach. “The fact that there’s not much you can do about neurological diseases has pushed Genescent in that direction,” explains Gregory.

“Longevity has many approaches,” stresses Gregory. “Genescent developed STEMCELL100 to gain time, because we’re all in a race with the clock.” In fact, Gregory feels that buying time to let the technology for suspension and resuscitation develop is the most challenging aspect of cryonics. Because resuscitation from cryopreservation is likely to be a last-in-first-out technology, he is convinced that the more time you can get now, the sooner you’ll see the future. “The later you emerge, the harder will be the adjustments to future societies.”

As a science fiction author, Gregory has written over twenty-five novels, including *Jupiter Project*, *Artifact*, *Against Infinity*, *Eater*, and *Timescape*. He is a two-time winner of the Nebula Award, and has also won the John W. Campbell Award, the Australian Ditmar Award, and the 1990 United Nations Medal in Literature. In 1989 he was host and scriptwriter for the television

series “A Galactic Odyssey,” and later contributed to Japan 2000. He has served as scientific consultant to the NHK Network and for Star Trek: The Next Generation. His scientific contributions and awards are also numerous – importantly, his work for contributions to science and the public comprehension of it was commended by his receipt of the Lord Foundation Award in 1995. You can see what he’s up to at gregorybenford.com.

Aside from his work in science and science fiction, Gregory enjoys an active life. He loves the beach in particular and has been an avid surfer for years, though he mostly prefers to body surf now. Living on the beach also allows him the opportunity to swim every day. Additionally, he takes great pleasure in hiking and travel – “the banquet of life,” as he calls it. And, as with many members, making cryonics arrangements has contributed to his passionate indulgence in life. “Focusing on the long future made me live more intensely,” he acknowledges.

Last, but not least, Gregory wants other members to know that their contributions to the cryonics effort matter. “The more [cryonics] is accepted, the better our odds of developing a community that can carry us forward into a future well beyond our detailed imagining, but possible for us to reach. Let’s do it. Our lives are at stake!” ■

ISAAC FROM THE OUTSIDE

by Gregory Benford

For years I knew Isaac from the outside,
through dread nightfalls and fresh daybreaks
 over the galactic empire,
 seeking as a teenage kid from Alabama
to know a future that hung foggy, shadowed.
Till I met him and in his penthouse high saw
Shades drawn against the immensity lurking over
Central Park. He would not lie in a bed against that
 outer wall, he who deployed battle cruisers
 through the starlit sevagram, and was a guy
 who would not fly
in airplanes (one roller coaster was enough)
 No, not tough
that way. Afraid of heights, yet he lived in a penthouse
 because Janet wanted to,
 for the view,
and once—only once—in a tux
 high above Manhattan's flux
 he backed out on the balcony
for a photo, never looking around.
 Or hearing the sound
 of time's sure falling.
Still, he saw the silky realm above,
even if those city-planet dwellers of Trantor
also feared their heavens. New Yorkers, all,
 they loved their warrens.
Why not look further? I wondered,
while you debate the Galactic Empire's politics
 in comfy rooms.
He would not entertain, when I brought it up,
the odd, chilly idea of cryonics.
 "I'll die with my books on,"
 he said, "and be gone."
And the other dreamers:
 crisp Heinlein, folksy Simak,
 crusty Jack Williamson, wise Silverberg,
ever-young Clarke, even Fred Pohl in his rational rigor—
 all wrote of passing like sunrise rays
 through the cold nitrogen lens to see
 landscapes beyond our gray reality.

But none I found would take a "free freeze,"
 as one cryonerd told me.
Ginny Heinlein said he (and she) didn't want him
 to come back
 from that dark silent cold,
 though he was bold
and sure a better destiny brimmed ahead.
Bradbury sipped a cool dry martini
 (having gotten two for Aldiss' one)
and deployed the neighborhood argument:
 "I'd be alone in a world I didn't know,"
 forgetting that's the way he came in.
No warm wife or daughters, maybe
 —though why couldn't they come?—
yet fans aplenty, time-steeped in his voice, nostalgic.
 There up ahead beckons a life
 splashed across a bright new world,
 and more—
vistas strange beyond the punctured metallic sky
 huge above Metropolis.
So I wondered why he did not rage against
 the fall of that night.
 There's much up ahead, he said,
 But you'll be...dead.
Whatever the odds, Isaac (and yes, they are small),
at the very worst you would lie in a sterile dry hospital
 (bed on an inside wall, please)
amid all those strained dim faces dear to you,
 your past peeling out behind,
 a plot outline
 run backward.
Morphine-soft air and coughing out your last,
 about to endow your Foundation,
 end of story, yes.
Yet the cryonics techs down the hall,
waiting for the last notes strumming
 in the back of your woozy mind
at a still center, would give a gift:
 you'd smile —
and go to that great deep release
 with a thin sliver of hope.

MEETINGS

About the Alcor Foundation

The Alcor Life Extension Foundation is a nonprofit tax-exempt scientific and educational organization dedicated to advancing the science of cryopreservation and promoting cryonics as a rational option. Being an Alcor member means knowing that—should the worst happen—Alcor's Emergency Response Team is ready to respond for you, 24 hours a day, 365 days a year.

Alcor's Emergency Response capability includes specially trained technicians and customized equipment in Arizona, northern California, southern California, and south Florida, as well as many additional certified technicians on-call around the United States. Alcor's Arizona facility includes a full-time staff, and the Patient Care Bay is personally monitored 24 hours a day.

ARIZONA

Flagstaff:

Arizona without the inferno. Cryonics group in beautiful, high-altitude Flagstaff. Two-hour drive to Alcor. Contact eric@flagstaffcryo.com for more information.

Scottsdale:

This group meets the third Friday of each month and gatherings are hosted at a home near Alcor. To RSVP, visit <http://cryonics.meetup.com/45/>.

At Alcor:

Alcor Board of Directors Meetings and Facility Tours – Alcor business meetings are generally held on the first Saturday of every month starting at 11:00 AM MST. Guests are welcome. Facility tours are held every Tuesday and Friday at 2:00 PM. For more information or to schedule a tour, call D'Bora Tarrant at (877) 462-5267 x101 or email dbora@alcor.org.

CALIFORNIA

Los Angeles:

Alcor Southern California Meetings—For information, call Peter Voss at (310) 822-4533 or e-mail him at peter@optimal.org. Although monthly meetings are not held regularly, you can meet Los Angeles Alcor members by contacting Peter.

San Francisco Bay:

Alcor Northern California Meetings are held quarterly in January, April, July, and October. A CryoFeast is held once a year. For information on Northern California meetings, call Mark Galeck at (408) 245-4928 or email Mark_galeck@pacbell.net.

DISTRICT OF COLUMBIA

Life Extension Society, Inc. is a cryonics and life extension group with members from Washington, D.C., Virginia, and Maryland. Meetings are held monthly. Contact Secretary Keith Lynch at kfl@keithlynch.net. For information on LES, see our web site at www.keithlynch.net/les.

FLORIDA

Central Florida Life Extension group meets once a month in the Tampa Bay area (Tampa and St. Petersburg) for discussion and socializing. The group has been active since 2007. Email arcturus12453@yahoo.com for more information.

NEW ENGLAND

Cambridge:

The New England regional group strives to meet monthly in Cambridge, MA – for information or to be added to the Alcor NE mailing list, please contact Bret Kulakovich at 617-824-8982, alcor@bonfireproductions.com, or on FACEBOOK via the Cryonics Special Interest Group.

PACIFIC NORTHWEST

Cryonics Northwest holds regular meetings for members of all cryonics organizations living in the Pacific Northwest.

For information about upcoming meetings and events go to: <http://www.cryonicsnw.org/> and <http://www.facebook.com/cryonics.northwest> A Yahoo mailing list is also maintained for cryonicists in the Pacific Northwest at <http://tech.groups.yahoo.com/group/CryonicsNW/>.

British Columbia (Canada):

The contact person for meetings in the Vancouver area is Keegan Macintosh: keegan.macintosh@me.com

Oregon:

The contact person for meetings in the Portland area is Chana de Wolf: chana.de.wolf@gmail.com

Washington:

The contact person for meetings in the Seattle area is Regina Pancake: rpancake@gmail.com

ALCOR PORTUGAL

Alcor Portugal is working to have good stabilization and transport capabilities. The group meets every Saturday for two hours. For information about meetings, contact Nuno Martins at n-martins@n-martins.com. The Alcor Portugal website is: www.alcorportugal.com.

TEXAS

Dallas:

North Texas Cryonauts, please sign up for our announcements list for meetings (<http://groups.yahoo.com/group/cryonauts-announce>) or contact David Wallace Croft at (214) 636-3790 for details of upcoming meetings.

Austin/Central Texas:

We meet at least quarterly for training, transport kit updates, and discussion. For information: Steve Jackson, 512-447-7866, sj@sjgames.com.

UNITED KINGDOM

There is an Alcor chapter in England. For information about meetings, contact Alan Sinclair at cryoservices@yahoo.co.uk. See the web site at www.alcor-uk.org.

If you are interested in hosting regular meetings in your area, contact Alcor at 877-462-5267, ext. 113. Meetings are a great way to learn about cryonics, meet others with similar interests, and introduce your friends and family to Alcor members!

WHAT IS CRYONICS?

Cryonics is an attempt to preserve and protect human life, not reverse death. It is the practice of using extreme cold to attempt to preserve the life of a person who can no longer be supported by today's medicine. Will future medicine, including mature nanotechnology, have the ability to heal at the cellular and molecular levels? Can cryonics successfully carry the cryopreserved person forward through time, for however many decades or centuries might be necessary, until the cryopreservation process can be reversed and the person restored to full health? While cryonics may sound like science fiction, there is a basis for it in real science. The complete scientific story of cryonics is seldom told in media reports, leaving cryonics widely misunderstood. We invite you to reach your own conclusions.

HOW DO I FIND OUT MORE?

The Alcor Life Extension Foundation is the world leader in cryonics research and technology. Alcor is a non-profit organization located in Scottsdale, Arizona, founded in 1972. Our website is one of the best sources of detailed introductory information about Alcor and cryopreservation (www.alcor.org). We also invite you to request our FREE information package on the "Free Information" section of our website. It includes:

A fully illustrated color brochure

- A sample of our magazine
- An application for membership and brochure explaining how to join
- And more! Your free package should arrive in 1-2 weeks. (The complete package will be sent free in the U.S., Canada, and the United Kingdom.)

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(The complete package will be sent free in the U.S., Canada, and the United Kingdom.)

HOW DO I ENROLL?

Signing up for a cryopreservation is easy!

Step 1: Fill out an application and submit it with your \$150 application fee.

Step 2: You will then be sent a set of contracts to review and sign.

Step 3: Fund your cryopreservation. While most people use life insurance to fund their cryopreservation, other forms of prepayment are also accepted. Alcor's Membership Coordinator can provide you with a list of insurance agents familiar with satisfying Alcor's current funding requirements.

Finally: After enrolling, you will wear emergency alert tags or carry a special card in your wallet. This is your confirmation that Alcor will respond immediately to an emergency call on your behalf.

Call toll-free today to start your application:

877-462-5267 ext. 132

info@alcor.org

www.alcor.org





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Your best chance at achieving future immortality is to protect your precious health now so you can benefit from future medical breakthroughs. Staying informed about the latest health discoveries can mean the difference between life and premature death.

And the **Life Extension Foundation** can be your passport to the future. As the largest anti-aging organization in the world, we are dedicated to finding scientific ways to prevent disease, slow aging, and eventually stop death.

For more than two decades, Life Extension has been at the forefront of the movement to support revolutionary anti-aging research that is taking us closer to our goal of extending the healthy human life span indefinitely. We inform our members about path-breaking therapies to help keep them healthy and alive.

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- Access to a toll-free phone line to speak with **knowledgeable health advisors**, including naturopathic doctors, nutritionists, and a cancer expert, about your individual health concerns. You can also receive help in developing your own personal life extension program.
- **Discounts on prescription drugs, blood tests, and pharmaceutical quality supplements** that will greatly exceed

your membership dues. You'll receive a directory listing the latest vitamins and supplements, backed by scientific research and available through a unique buyers club.

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- ***Disease Prevention and Treatment* book** (\$49.95 cover price) ...this hardbound fourth edition provides novel information on complementary therapies for 133 diseases and illnesses—from Alzheimer's disease to cancer, from arthritis to heart disease—that is based on thousands of scientific studies.

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